



Kentucky Academic Course Code List

Mathematics Courses
without Certification

Kentucky Academic Course Codes

The Kentucky Department of Education (KDE) initiated a course code project under the direction of Commissioner Pruitt in January 2017. The project ensures Kentucky is providing equitable opportunity and access to research-based student experiences that impact student success.

The results of the project include an alignment of core academic course codes to Kentucky Academic Standards. The standards aligned to the core academic course codes cannot be changed. The alignment serves as a guarantee to students across the Commonwealth that all students have equitable access to Kentucky Academic Standards. The project also provides an alignment to Kentucky's new Accountability System, 703 KAR 5:270, which measures opportunity and access provided to students across Kentucky.

The Kentucky Academic Course Code List contains a listing of course codes and descriptions along with certifications that fit the parameters for given courses. The content listed for a course cannot be changed; however, the grade range and population information listed for each course are not absolute and can vary slightly depending on the needs of the school and teacher certifications. Districts should choose the course that most closely represents the content in a given course. ***The description and content of a course are the determining factors in what should be selected.***

Contact Information:

- Districts may contact CourseCodes@education.ky.gov with questions pertaining to course codes, course content and course-standards alignment.
- Districts may contact the EPSB Division of Certification at (502) 564-4606 or dcert@ky.gov with question pertaining to certification.
- Districts may contact KHEAA at (502) 696-7397 or kees@kheaa.com with questions pertaining to KEES eligibility.

HOW TO USE THIS DOCUMENT

This document contains a listing of course codes and descriptions along with certifications that fit the parameters for given courses. The grade range listed for each course are not absolute. Please choose the course that most closely represents the content in a given course.

EXAMPLE

John Q Middle School had 5th, 6th, and 7th grade students taking a Visual Art course. This course would be linked to course number **500711: Visual Art – Comprehensive**, which shows a recommended grade range of 6 – 12.

Schools will link their courses on the Infinite Campus “Course Master” tab OR in the “Course” tab to courses listed in this document.

Schools may have created courses that are very unique in order to meet students’ needs. If a course does not meet the definition or content of one contained in this document, please use course number **909999: School Defined Course**, and define the correct content through the LEAD report.

The course code 909999 should be used in situations where a current course code does not exist and there are no existing Kentucky Academic Standards aligned to the course. Local Boards of Education should approve the use of a district's use of a 909999 course code *before* a district begins utilizing it within Infinite Campus. Please see the [Guiding Principles For Using Course Code 909999](#) for more information.

CERTIFICATIONS

It is important to note that the certificates listed are the ones that fit ***ALL*** of the parameters for a specific course; there may be other certificates that can teach it with slightly more restrictive parameters.

Please take note of the following information from *The Kentucky Academic Standards* with regard to middle school courses that are offered for high school credit.

High School Credit Earned in Middle School

It is expected that most students will earn high school credits during their high school years. However, local school districts may offer high school courses to middle level students if the following criteria are met:

- the content and the rigor of the course are the same as established in the *Kentucky Academic Standards*
- the students demonstrate mastery of the middle level content as specified in the *Kentucky Academic Standards*
- the district has criteria in place to make reasonable determination that the middle level student is capable of success in the high school course
- **the middle level course is taught by teachers with either secondary or middle level certification with appropriate content specialization**

Although middle level courses list the Provisional and Standard Elementary Certificates, Grades 1-8 as allowable under the parameters of these courses, they will not meet the above requirements for courses that are offered for high school credit.

This document is a guide; therefore the EPSB disclaims any warranties as to the validity of the information in this document. Users of this document are responsible for verifying information received through cross-referencing the official record in the EPSB's Division of Certification. The EPSB shall not be liable to the recipient, or to any third party using this document or information obtained therefrom, for any damages whatsoever arising out of the use of this document.

Mathematics

(270000)

Mathematics - Middle (270200)

270201 - Grade 6 Mathematics

Grade Level: 6 - 6

Credits:

Description: In Grade 6, instructional time should focus on the critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking. (1) Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates. (2) Students use the meaning of fractions and the meanings of and relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane. (3) Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and use the properties of operations to rewrite equivalent expressions. Students know the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables and they use equations (such as $3x = y$) to describe relationships between quantities. (4) Building on and reinforcing their understanding of number, students begin to develop their ability to think statistically. Students recognize a data distribution may not have a definite center and different ways to measure center yield different values. Students recognize a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected. Students also build on their work with area from elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of triangles and special quadrilaterals by decomposing these shapes and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Content: Middle School Mathematics (general)

Population: General

[270201 Grade 6 Mathematics Course Standards Document](#)

270202 - Grade 7 Mathematics

Grade Level: 7 - 7

Credits:

Description: In Grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples. (1) Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships. (2) Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems. (3) Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. (4) Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

Content: Middle School Mathematics (general)

Population: General

[270202 Grade 7 Mathematics Course Standards Document](#)

270203 - Grade 8 Mathematics

Grade Level: 8 - 8

Credits:

Description: In Grade 8, instructional time should focus on three critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem. (1) Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$), understanding that the

constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x -coordinate changes by an amount A , the output or y -coordinate changes by the amount $m \times A$. Students also use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship (such as slope and y -intercept) in terms of the situation. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are the same line. Students use linear equations, systems of linear equations, linear functions, and their understanding of slope of a line to analyze situations and solve problems. (2) Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations. (3) Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.

Content: Middle School Mathematics (general)

Population: General

[270203 Grade 8 Mathematics Course Standards Document](#)

270290 - Mathematics Intervention (Middle School)

Grade Level: 6 - 8

Credits:

Description: This course is for students who need additional time and support or for students in mathematics at the middle school level that could benefit from enrichment. This course includes support for all middle school mathematics courses.

Content: Middle School Mathematics (general)

Population: General

Mathematics - Algebra

(270300)

270301 - HS Pre-Algebra/Pre-High School Mathematics (Grades 9 - 10)

Grade Level: 9 - 10

Credits: 1E

Description: This course should focus on skills necessary to be successful in a HS Algebra 1 course and is not necessarily limited to the following: (1) completing understanding of division of fractions and extending the notion of number to the system of rational numbers and developing understanding of operations with rational numbers and writing, interpreting, and using expressions and equations; (2) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (3) developing understanding of and applying proportional relationships and solving problems involving scale drawings; (4) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (5) grasping the concept of a function and using functions to describe quantitative relationships; (6) understanding and applying the Pythagorean Theorem; (7) working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume and (8) developing understanding of statistical thinking and drawing inferences about populations based on samples. This course cannot serve as Algebra 1, Geometry or Algebra 2 credit for high school graduation. This course is not available for middle school students because middle school mathematics is pre-algebra and is described as such in this course description. This course is for high school students who are not prepared to successfully complete a high school Algebra 1 course or an Integrated 1 course.

Content: Pre-Algebra

Population: General

270304 - Algebra 1

Grade Level: 9 - 11

Credits: 1

Description: This course is the study of high school Algebra 1 content. Upon completion of the course, students should be able to represent relationships mathematically, develop fluency in writing, interpret expressions and equations, translate between various forms of linear equations and inequalities and use them to solve problems including those that require a system of equations, solve linear equations, apply related solution techniques and the laws of exponents to solve simple exponential equations, understand function definition and notation, contrast linear and exponential graphical representations, make judgments about the appropriateness of linear models, perform arithmetic operations on inequalities, interpret functions and fluently use function notation, construct and compare linear and exponential models and solve related problems, factor quadratic and cubic expressions solve quadratic equations to interpret related quadratic functions and explore non-linear relationships. This course should be designed to meet the high school graduation credit for Algebra 1 and to build a solid foundation necessary for future high school math courses.

This course contains "modeling" standards. Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Mathematical modeling is the process of choosing and applying appropriate mathematical content to analyze empirical situations. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and

comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: Algebra I

Population: General

[270304 Algebra 1 Course Standards Document](#)

270309 - Mathematics Intervention (High School)

Grade Level: 9 - 12

Credits: 1E

Description: This course is for students who need additional time and support or for students in mathematics at the high school level who could benefit from enrichment. This course includes support for all high school mathematics courses.

Content: High School Mathematics (General)

Population: General

270311 - Algebra 2

Grade Level: 9 - 12

Credits: 1

Description: This course is the study of high school Algebra 2 content. Upon completion of the course, students should be able to use properties of numerical operations to perform calculations involving polynomials,, identify zeros of polynomials and make connections between zeros of polynomials and solutions of geometry to extend trigonometry to model periodic phenomena, work with a variety of function families exploring the effects of transformations, analyze functions using different representations, build, interpret and compare functions including square root, cube root, piece-wise, trigonometric and logarithmic functions, identify appropriate functions to model situations, adjust parameters to improve the models, and compare models by analyzing appropriateness of fit.

NOTE: The content of the course is High School Algebra 2 and may be titled locally as Applied Algebra 2, Technical Algebra 2 or named as an interdisciplinary Algebra 2. This code is to be used for both middle and high school students taking Algebra 2 for graduation credit. It is also to be used in lieu of the Integrated/Applied Math 3 or 4 depending on which course completes the required high school math curriculum (see course code 270704). (Please consult the EPSB website regarding teaching permissions for teaching this course in middle school grades 6-8. Credentials listed for this course code (270311) are KY EPSB certified high school mathematics teachers.)

This course contains "modeling" standards. Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Mathematical modeling is the process of choosing and applying appropriate mathematical content to analyze empirical situations... When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: Algebra II

Population: General

[270311 Algebra 2 Course Standards Document](#)

270320 - Algebra 3

Grade Level: 11 - 12

Credits: 1E

Description: The content of this course goes beyond a traditional Algebra 2 course and should provide opportunities for students to: solve applied (in context) problems using various types of equations (linear, quadratic, exponential, trigonometric, logarithmic and power functions piece-wise), read and analyze real-life problems using mathematical modeling, perform matrix operations, graph and interpret data represented by linear, quadratic, exponential, logarithmic and power functions, use numerical and graphical data to make reasonable and valid conclusions, solve applied problems that can be modeled with equations and inequalities involving absolute value, solve systems of linear equations using several techniques including matrices, use and verify trigonometric identities, solve applied problems that can be modeled with exponential and logarithmic equations, find terms of sequences and find the sum of finite series.

Content: Advanced Topics in Mathematics

Population: General

Mathematics - Geometry (270400)

270401 - Geometry

Grade Level: 9 - 12

Credits: 1

Description: This course is the study of high school Geometry content. Upon completion of the course, students should be able to prove theorems and solve problems about triangles, quadrilaterals, and other polygons, apply reasoning to complete geometric constructions and explanations, establish triangle congruence criteria based on analyses of rigid motions and formal constructions, use similarity to solve problems and apply similarity in right triangles to understand right triangle trigonometry (with particular attention to special right triangles and the Pythagorean theorem), develop the Law of Sines and Cosines from understanding relationships in right triangles, apply knowledge of two-dimensional shapes to consider the shapes of cross-sections and the result of rotating a two-dimensional object about a line, connect algebraic concepts to geometric concepts through the rectangular coordinate system (such as deriving the equation of a circle given the center and radius length using the distance formula or Pythagorean Theorem) and prove basic theorems about circles, chords, secants, and tangents.

Since the content of Applied Geometry, Technical Geometry, Honors Geometry, Accelerated Geometry and other courses named as an interdisciplinary geometry is "High School Geometry", the course code 270401 - HS Geometry should be used; however, this course may be titled locally as Applied Geometry, Technical Geometry, Honors Geometry, Accelerated Geometry, MST Geometry or named as an interdisciplinary Geometry.

This course contains "modeling" standards. Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Mathematical modeling is the process of choosing and applying appropriate mathematical content to analyze empirical situations. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: Geometry

Population: General

[270401 Geometry Course Standards Document](#)

Mathematics - Calculus (270500)

270501 - Pre-Calculus

Grade Level: 10 - 12

Credits: 1E

Description: This course is designed for students to attain the concepts necessary to be successful in a Calculus course, an AP Calculus course or a College Calculus course. Objectives for this course should include, but are not limited to: solve equations and inequalities involving polynomial, rational, exponential, logarithmic and trigonometric functions, understand and apply the behavior and properties of polynomial, rational, exponential, logarithmic, and trigonometric functions, graph polynomial, rational, exponential, logarithmic, and trigonometric functions, use technology to solve and graph various types of equations and inequalities and prove trigonometric identities. Standards for this course may also include the (+) standards denoted in the Kentucky academic standards document. NOTE: Since the content of Honors Pre-Calculus, Accelerated Pre-Calculus and MST Pre-Calculus is pre-calculus, the course code 270501 Pre-Calculus should be used; however, this course may be titled locally as Honors Pre-Calculus, Accelerated Pre-Calculus or MST Pre-Calculus. IB pre-calculus classes should use 270505.

Content: Pre-Calculus

Population: General

270505 - IB Pre-Calculus

Grade Level: 10 - 12

Credits: 1E

Description: This course is designed to address the curriculum for the IB Pre-Calculus course as described in the International Baccalaureate (IB) guidelines. Only schools with an IB program should use this code (270505) for Pre-Calculus. All others should use course code 270501 Pre-Calculus.

Content: Pre-Calculus

Population: General

270511 - Calculus

Grade Level: 11 - 12

Credits: 1E

Description: This course is designed to address all the concepts normally covered in differential and integral calculus. Students who successfully complete this course should be able to demonstrate an understanding and use of the concept of a function, whether the function is represented by tabulated data, graphs, or formulas, use calculus to formulate and solve problems, understand the derivative as a rate of change, including its connections to tangent lines, linear approximations, extrema, and instantaneous velocity, understand the definite integral as a measurement of area, as a limit, and as an inverse of differentiation, use technology to solve problems, compute limits, derivatives, and anti-derivatives and determine the continuity of a function and understand its significance and effectively communicate solutions to problems using correct and precise mathematical language. Students taking this course are not expected to take the College Board Advanced Placement exam for AP Calculus AB or BC. This course code should not be used for IB, AP or dual credit calculus courses.

Content: Calculus

Population: General

270512 - IB Calculus

Grade Level: 11 - 12

Credits: 1E

Description: This course is designed to address the curriculum for the IB Calculus course as described in the International Baccalaureate guidelines. Only schools with an IB program should use this code (270512) for Calculus. All other schools should use course code 270511 Calculus or 270513 AP Calculus AB.

Content: Calculus

Population: General

270513 - AP Calculus AB

Grade Level: 10 - 12

Credits: 1E

Description: AP Calculus AB is roughly equivalent to a first semester college calculus course devoted to topics in differential and integral calculus. The AP course covers topics in these areas, including concepts and skills of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions. College credit is earned with a qualifying score on an AP exam.

Content: AP Calculus

Population: General

270514 - AP Calculus BC

Grade Level: 11 - 12

Credits: 1E

Description: AP Calculus BC is roughly equivalent to both first and second semester college calculus courses. It extends the content learned in AB to different types of equations (polar, parametric, vector-valued) and new topics (such as Euler's method, integration by parts, partial fraction decomposition, and improper integrals), and introduces the topic of sequences and series. The AP course covers topics in differential and integral calculus, including concepts and skills of limits, derivatives, definite integrals, the Fundamental Theorem of Calculus, and series. The course teaches

students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions. College credit is earned with a qualifying score on an AP exam.

Content: AP Calculus

Population: General

Mathematics - Other Mathematical Topics (270600)

270601 - Data and Measurement

Grade Level: 9 - 12

Credits: 1E

Description: This course should focus primarily on the conceptual categories: Statistics & Probability and Modeling and should include summarizing, representing and interpreting data and making inferences, justifying conclusions representing using linear, quadratic and exponential relationships and modeling descriptively and analytically. Technology should be an integral part of this course to generate plots, regressions functions and correlation coefficients and to simulate possible outcomes relatively quickly based on a given situation.

Content: Extended Topics In Algebra (Data and Measurement)

Population: General

270602 - Probability and Statistics

Grade Level: 9 - 12

Credits: 1E

Description: This course should focus primarily on the conceptual categories: Statistics & Probability and Modeling to address such concepts as theoretical and experimental probability, independent and conditional probability using them to interpret data, rules of probability to compute probabilities of compound events in a uniform probability model, calculations of expected values, analysis of decisions and strategies using probability concepts, binomial distributions, normal distributions, displaying and describing distributions of data, collecting data, measures of central tendency and spread and methods of inferential statistics. Technology should be an integral part of this course to generate plots, regressions functions and correlation coefficients and to simulate possible outcomes relatively quickly based on a given situation.

Content: Probability/Statistics

Population: General

270604 - AP Statistics

Grade Level: 11 - 12

Credits: 1E

Description: The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. The course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes in the AP Statistics course: exploring data, sampling and experimentation, anticipating patterns, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding. College credit is earned with a qualifying score on an AP exam.

Content: AP Statistics

Population: General

270611 - Discrete Mathematics

Grade Level: 10 - 12

Credits: 1E

Description: This course is designed for students who have completed high school mathematics courses through Algebra 2 and are interested in a future in business or computer applications, and should address such topics as set theory, proofs by mathematical induction, graph theory, permutations and combinations, and other topics as deemed appropriate.

Content: Discrete Mathematics

Population: General

270612 - Finite Mathematics

Grade Level: 10 - 12

Credits: 1E

Description: This course is designed for students who have completed high school mathematics courses through Algebra 2, and should include modeling situations through linear systems using matrices, linear inequalities systems (programming), data analysis, probability and finance applications. Course content may include but is not limited to: Finding an Euler circuit on a graph or show that no Euler circuit exists; solving the traveling salesperson problem for complete weighted graphs with four or fewer vertices using Hamiltonian cycles; finding a minimum cost spanning tree; schedule tasks using a list-processing algorithm; applying bin-packing heuristics; applying graph theory to real-world problems; solving real-world linear programming problems using the pictorial method and applying other mathematical models and techniques to real-world problems. See conceptual category for high school: Modeling for the basic mathematical modeling cycle and examples of modeling situations.

Content: Finite Mathematics

Population: General

270621 - Advanced Topics in Mathematics

Grade Level: 10 - 12

Credits: 1E

Description: This course is designed for students who have completed Algebra 1, Geometry and Algebra 2 content and should allow students to pursue topics in mathematics beyond content required for high school students. This course may cover topics from combined higher level courses or topics which are not found in other higher level courses but are of interest to students for college and career readiness. This course should be locally named according to the major content of the course.

Content: Advanced Topics in Mathematics

Population: General

270631 - Trigonometry

Grade Level: 10 - 12

Credits: 1E

Description: This course is designed for students who have completed Algebra 2 and want to proceed further into aspects of Trigonometry. This course should contain, but is not limited to: evaluating a trigonometric function for an angle expressed in radians and degrees, solving right and oblique triangles, including real-life applications, using and verifying (proving) trigonometric identities, solving trigonometric equations; and graphing and interpreting graphs of trigonometric functions in rectangular and polar form.

Content: Trigonometry

Population: General

270643 - Technical Mathematics

Grade Level: 10 - 12

Credits: 0.5E or 1E

Description: Some mathematical concepts from algebra, geometry, and trigonometry and applications relevant to these topics are studied. Topics to be covered include unit conversions, variation, measurement of geometric figures, vectors, and solving right and oblique triangles using trigonometry. Emphasis is on applications in the various technologies.

Content: High School Mathematics (General)

Population: General

270661 - Mathematics Concepts

Grade Level: 10 - 12

Credits: 0.5E or 1E

Description: This course is designed to be taken after completion of Algebra 1, Geometry and Algebra 2. Topics include probability and statistics, extension of algebra and geometry concepts, and discrete mathematics. This course could serve as a mathematics elective for high school graduation, but not as one of the three required credits for high school graduation: Algebra 1, Geometry or Algebra 2.

Content: Mathematics

Population: General

Mathematics - Integrated Mathematics (270700)

270701 - Integrated/Applied Mathematics 1

Grade Level: 9 - 10

Credits: 1

Description: This course is the first year of Integrated Mathematics pathway. The integrated approach to high school mathematics is typically seen internationally and consists of a sequence of three to four courses depending on school's curriculum; each course includes number, algebra, geometry, probability and statistics and is no less rigorous than a traditional pathway: Algebra 1, Geometry and Algebra 2. Typically Integrated 1 has more geometric concepts than a traditional Algebra 1 course. For possible models on how to organize HS standards into courses, see the Common Core State Standards, Appendix A: Integrated Model Course Pathways in Mathematics or the open education resource Mathematics Vision Project at <http://www.mathematicsvisionproject.org/curriculum.html>.

This course includes "modeling" standards. Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Mathematical modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods. When creating mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Modeling with mathematics is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: High School Mathematics, Algebra, Geometry

Population: General

[270701 Integrated Applied Mathematics 1 Course Standards Document](#)

270702 - Integrated/Applied Mathematics 2

Grade Level: 10 - 11

Credits: 1

Description: This course is the second year of Integrated Mathematics. The integrated approach to high school mathematics is typically seen internationally and consists of a sequence of three to four courses depending on school's curriculum; each course includes number, algebra, geometry, probability and statistics and is no less rigorous than a traditional pathway: Algebra 1, Geometry and Algebra 2. Typically Integrated II has a blend of geometric and algebraic concepts along with probability. For possible models on how to organize HS standards into courses, see the Common Core State Standards, Appendix A: Integrated Model Course Pathways in Mathematics or the open education resource Mathematics Vision Project at <http://www.mathematicsvisionproject.org/curriculum.html>. If the integrated series, Integrated 1, Integrated 2 and Integrated 3 is used in place of the traditional series of Algebra 1, Geometry and

Algebra 2 and the integrated series allows students the access and opportunity to learn all required high school mathematics standards then students who complete this series have met the high school graduation requirements of Algebra 1, Geometry and Algebra 2.

This course contains "modeling" standards. Mathematical modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Modeling with mathematics is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: High School Mathematics, Algebra, Geometry

Population: General

[270702 Integrated Applied Mathematics 2 Course Standards Documents](#)

270703 - Integrated/Applied Mathematics 3

Grade Level: 10 - 12

Credits: 1

Description: This course is the third course of Integrated Mathematics. The integrated approach to high school mathematics is typically seen internationally and consists of a sequence of three to four courses depending on school's curriculum; each course includes number, algebra, geometry, probability and statistics and is no less rigorous than a traditional pathway: Algebra 1, Geometry and Algebra 2. Typically, Integrated 3 has a blend of geometric, algebraic and statistical concepts using modeling. For possible models on how to organize HS standards into courses, see the Common Core State Standards, Appendix A: Integrated Model Course Pathways in Mathematics or the open education resource Mathematics Vision Project at <http://www.mathematicsvisionproject.org/curriculum.html>.

If the integrated series, Integrated 1, Integrated 2 and Integrated 3 is used in place of the traditional series of Algebra 1, Geometry and Algebra 2 and the integrated series allows students the access and opportunity to learn the required high school mathematics standards then students who complete this series have met the high school graduation requirements of Algebra 1, Geometry and Algebra 2.

This course contains "modeling" standards. Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Mathematical modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Modeling with mathematics is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: High School Mathematics, Advanced Algebra, Geometry

Population: General

[270703 Integrated Applied Mathematics 3 Course Standards Document](#)

270704 - Integrated/Applied Mathematics 4

Grade Level: 11 - 12

Credits: 1E

Description: An integrated approach to high school mathematics is typically seen internationally and consists of a sequence of four courses depending on school's curriculum; each course includes number, algebra, geometry, probability and statistics and is no less rigorous than a traditional pathway of Algebra 1, Geometry, Algebra 2 and pre-calculus. This course is the fourth year of an integrated mathematics sequence and should address the (+) standards included in the Kentucky Academic Standards. This course is beyond Algebra 2 and therefore, should not be used as the Algebra 2 course to meet graduation requirements. For possible models on how to organize HS standards into integrated courses, please see the Appendix A: Integrated Model Course Pathways in Mathematics or the open education resource Mathematics Vision Project at <http://www.mathematicsvisionproject.org/curriculum.html>.

If the integrated series, Integrated I, Integrated II and Integrated III is used in place of the traditional series of Algebra 1, Geometry and Algebra 2 and the integrated series allows students the access and opportunity to learn the required high school mathematics standards then students who complete this series have met the high school graduation requirements of Algebra 1, Geometry and Algebra 2. At the end of Integrated III, students will be required to take the EOC for Algebra 2.

This course contains "modeling" standards. Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social, and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data. Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★).

Content: High School Mathematics, Advanced Algebra, Geometry

Population: General